

LARGE ON-SITE SYSTEMS

DEFINITION

A “large” on-site wastewater disposal system has a projected daily sewage flow greater than 2500 gallons. The effluent from a large system is discharged ultimately to the ground water table, either through disposal beds or infiltration basins. All applications for a large on-site system must include a written assessment of the impact of the proposed system on water quality and public health. If the report concludes that pollutants (e.g. nitrates, bacteria, salts, etc.) will not cause ground water quality standards to be exceeded at the site boundary, then no additional treatment is required.

WATER QUALITY IMPACTS & TYPICAL LOADINGS

Twenty-two large systems operate in the Inland Bays watershed. At design flow, these 22 active large systems in the Inland Bays Basin are permitted to discharge up to 570,180 gallons of effluent per day. If effluent nitrogen concentrations average 40 mg/l and effluent phosphorus concentrations average 15 mg/l, these tanks release **69,400 pounds of nitrogen** per year and **26,000 pounds of phosphorus** per year.

Most of the large systems in the Inland Bays Basin provide the same level of treatment as septic systems.

All large systems are required to have a licensed operator to oversee operations of the wastewater treatment facility. Some developments either sell or contract out the operation of the wastewater treatment system to a wastewater utility.

MANAGEMENT TECHNIQUES & TYPICAL REDUCTIONS

- Require all new **large systems to pre-treat the effluent to secondary standards**, and to reduce effluent nutrient concentrations by the percentage reduction established by the TMDLs for that watershed or basin.
- Require **developers to work with DNREC staff during the design stages** of planning a subdivision or development to better site the location of the wastewater treatment facility.
- Ordinances or laws should be established to **oversee wastewater utilities**, just like other public service utilities. They should be required to demonstrate that they have suitably trained staff and that they are financially solvent.
- Require **wastewater utilities to post a performance bond** for each facility they operate

in order to guarantee that funds would be available to make repairs to the system in the event that the utility experiences financial difficulties and cannot afford to effect repairs to the wastewater treatment system.

- **Prohibit further construction in a development** if the wastewater treatment facility is failing or otherwise in violation of permit conditions.

TYPICAL COSTS

A large on-site system such as the one in Bethany Bay reduces the nitrogen content of the effluent to less than 10 mg/l. The system uses a sequential batch reactor and rapid infiltration beds. This 110,000-gallon facility serves 450 homes. The cost of this system was \$750,000 (\$500,000 for equipment, \$250,000 for disposal beds) or \$1667 per home. Nitrogen was reduced by 75%.

IMPLEMENTATION ISSUES

- If smaller, on-site systems are required to have advanced treatment, shouldn't we require the same from the large systems?
- Who in DNREC, or at the county level, would coordinate with the developer on all infrastructure and environmental concerns? How could the processes be streamlined?
- Should sewer system service be available before any development occurs?
- If large systems have a higher failure rate than individual systems, why permit use of the large systems at all?

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INLAND BAYS WATERSHED

This fact sheet was prepared by the Delaware Department of Natural Resources and Environmental Control's Whole Basin Team, at the request of the Inland Bays Tributary Action Teams, for citizens and stakeholders interested in one of Delaware's most environmentally and economically attractive areas—the Inland Bays and its surrounding lands, surface and ground waters.

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